

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 November 2002 (07.11.2002)

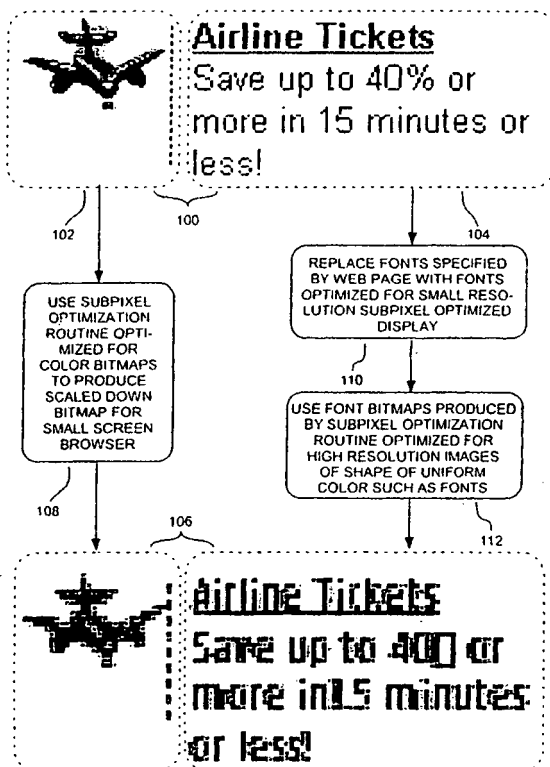
PCT

(10) International Publication Number
WO 02/088908 A3

- (51) International Patent Classification⁷: **G09G 5/00**, 60/296,283 5 June 2001 (05.06.2001) US
5/38, 5/06 60/296,281 5 June 2001 (05.06.2001) US
60/296,327 5 June 2001 (05.06.2001) US
(21) International Application Number: PCT/US02/14282 60/322,922 17 September 2001 (17.09.2001) US
- (22) International Filing Date: 2 May 2002 (02.05.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/288,287 2 May 2001 (02.05.2001) US
60/296,275 5 June 2001 (05.06.2001) US
60/296,274 5 June 2001 (05.06.2001) US
60/296,237 5 June 2001 (05.06.2001) US
60/296,284 5 June 2001 (05.06.2001) US
60/296,231 5 June 2001 (05.06.2001) US
60/296,224 5 June 2001 (05.06.2001) US
60/296,426 5 June 2001 (05.06.2001) US
60/296,273 5 June 2001 (05.06.2001) US
- (71) Applicant (for all designated States except US): **BIT-STREAM INC.** [US/US]; 215 First Street, Cambridge, MA 02142 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KAASILA, Sampo, J.** [SE/US]; 6 Squirrel Run Road, Plaistow, NH 03865 (US). **COLLINS, John, S.** [GB/US]; 9 Hawthorne Place, Apt. 9E, Boston, MA 02114 (US).
- (74) Agent: **PORTER, Edward, W.**; Porter & Associates, One Broadway, Suite 600, Cambridge, MA 02142 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,

[Continued on next page]

(54) Title: METHODS, SYSTEMS, AND PROGRAMMING FOR PRODUCING AND DISPLAYING SUBPIXEL-OPTIMIZED FONT BITMAPS USING NON-LINEAR COLOR BALANCING



(57) Abstract: A method of producing a sub pixel resolution representation of a shape suitable for display on a sub pixel addressed screen. The method comprises producing a scaled sub pixel optimized image of a bitmap image by associating a luminosity value with each sub pixel of the scaled image as a function of the percent of the area of the sub pixel's area in the image that is covered by the shape and a color balancing function designed to distribute a portion of a sub pixel's luminosity value that otherwise would cause color imbalance to nearby sub pixels of different colors. The percent of a sub pixel's luminosity values that is so distributed is a function of the percent of the sub pixel's luminosity value, which causes color imbalance. An advantage is that it reduces the amount of luminosity value distributed for color balance purposes to approximately only that amount which is necessary to achieve color balance, and increases the clarity of sub pixel optimized images.

WO 02/088908 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/14282

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G09G 5/00,5/38,5/06

US CL : 345/613

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/613, 619, 660

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
The raster tragedy at low resolution, Beat Stamm, Presentation at the training session

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
IEEE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,339,426 B1 (LUI et al) 15 January 2002 (15.01.2002), column 4, lines 15-24; column 17, lines 1-7; column 10, see fig. 7; column 11, lines 10-27; Fig. 1; Fig. 2; Fig. 9; Fig. 6; column 3, lines 59-67; column 17, lines 15-55; column 3, line 40-58; column 15, lines 5-15; column 4, lines 15-24.	1-6; 8-13; 15-21; 23-38; 41-45
X	The raster tragedy at low resolution, Beat Stamm, 29 October 1997 (29.10.1997), Page 4; Page 2, Fig. 2.	7,13-14,22,39,40



Further documents are listed in the continuation of Box C.



See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"B" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

09 September 2002 (09.09.2002)

Date of mailing of the international search report

22 NOV 2002

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Michael Razay

Telephone No. 703-306-0777



GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent

(88) Date of publication of the international search report:

3 April 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.